antennal scale, armed with six to eight dorsal teeth
Troglocubanus eigenmanni (Hay, 1903). Caves in Pinar del Río, Havana, and Matanzas Provinces, Cuba.

13. Rostrum reaching beyond eyes. Second chelipeds with two spines on merus and one on carpus
Euryrhynchus burchelli Calman, 1907. Well at Pará, Brazil.

Rostrum not reaching beyond eyes. Second chelipeds without meral or carpal spines
Euryrhynchus wrzesniowskii Miers, 1877. Wells and heavily shaded pools and creeks in British, Dutch, and French Guiana.

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ZOOLOGY.—*Geographical distribution and means of dispersal of the bathypelagic nemerteans found in the great submarine canyon at Monterey Bay, California.*

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The bathypelagic nemerteans, which are specially adapted for life in the intermediate depths of the oceans, have been found as sparse populations in all the oceans except the Arctic north of the continents. They occur most frequently at depths of 600 to 2,000 meters, and consequently their environmental conditions show relatively little variation throughout the oceans. Since many of them are believed to be transported by deep ocean currents, information concerning their known geographical distribution is of interest to both biologists and oceanographers.

In most of the bathypelagic species the body is flattened horizontally, with much gelatinous parenchyma separating the internal organs, while in some species the specific gravity is further decreased by lipoid globules in the digestive systems. Because of the density and high viscosity of the water due to low temperature and great pressure, the worms are enabled to maintain their positions with a minimum of muscular effort. Most of the species have only feeble musculatures and many of them are presumably carried passively, with slowly undulating movements, throughout the oceanic systems in the currents and eddies which they are thought to inhabit.

Relatively little is known as to the direction and velocity of these currents, although Coe (1945, 1946) has published, with the cooperation of Dr. H. U. Sverdrup, a chart of the principal known currents of the North Atlantic at the depths inhabited by the nemerteans. The available evidence indicates that these currents have an average velocity of about 1 mile in 4 days or 90 miles per year. Comparable currents in the Pacific are even less well known although their existence is fully established.

Some of the individuals recently found in the great canyon prove to be specifically identical with those of well-known species of the Atlantic, and it must have required a very long time for their ancestors to be carried from one of these oceans to the other. It should be recalled, however, that in the late Triassic era the Atlantic and Pacific had a broad connection between North and South America.

[1] Contribution from the Scripps Institution of Oceanography, new series.

The collections were made by the personnel of the Hopkins Marine Station in connection with work on Office of Naval Research contract N6onr 25127, NR 163 901. All of them were obtained at the center of the outer portion of the great Monterey submarine canyon (lat. 36° 41′ 54″ N.; long. 122° 02′ 24″ W.), where the depth of water exceeds 1,000 meters. For each haul a 1-meter net was drawn for 1 hour after reaching depths of 650 to 1,160 meters and raised to the surface while still open. It is probable, however, that the nemerteans were caught at or near the lowest depths. This survey was conducted under the direction of Dr. Rolf L. Bolin and Dr. Donald P. Abbott, who have kindly provided the writer with the material which forms the basis of this report.

One or two nemerteans were obtained in each of 29 of the 141 net hauls at that locality made at intervals during two years. One or more representatives of 16 of the 29 species at present known to inhabit the Pacific Ocean were obtained. This is a surprisingly large number in consideration of the fact that only 57 species had been found previously in all the oceans of the world. Eight of the species, described elsewhere (Coe, 1954), are new to science, while the others had been recorded from distant parts of the Pacific and other oceans.

The geographical distribution, insofar as at present known, of each of the species in these collections is here indicated:

Family Protopelagonemertidae

Plotonemertes adhaerens Brinkmann—North and South Pacific and North Atlantic.

Family Planktonemertidae

Tononemertes pellucida Coe—Equatorial and North Pacific.

Family Dinonemertidae

Tubonemertes aureola Coe—North and South Pacific.

Tubonemertes (*Paradinonemertes*) *wheeleri* Coe—North Pacific and North Atlantic.

Dinonemertes mollis Coe—Equatorial and North Pacific.

Paradinonemertes macrostomum Coe—Equatorial and North Pacific.

Family Chuniellidae

Chuniella tenella Coe—North Pacific.

Chunianna opaca Coe—North Pacific.

Chunianna pacifica Coe—North Pacific.

Family Nectonemertidae

Nectonemertes mirabilis Verrill—Eastern and western Pacific, North and South Atlantic.

Nectonemertes primitiva Brinkmann—Equatorial and North Atlantic, Equatorial and North Pacific.

Family Pelagonemertidae

Cuneonemertes elongata Coe—North Pacific.

Cuneonemertes nigra Coe—North Pacific and North Atlantic.

Cuneonemertes obesa Coe—North Pacific.

Pelagonemertes joubini Coe—Equatorial and North Pacific.

Pelagonemertes rollestoni Moseley—North and South Pacific, North and South Atlantic, Indian and Antarctic.

The abundance and wide distribution of *Plotonemertes adhaerens* and *Nectonemertes mirabilis* may be correlated with their peculiar adaptions for sexual union, since the males of the former species have special glandular organs which are thought to enable them to cling to their mates, while mature males of the latter species have long, muscular tentacles supposedly for the same purpose. Internal fertilization may be assumed for all the species, although it has not been proved for any.

Pelagonemertes rollestoni appears to have a wider distribution than any of the other species, although the number of recorded specimens does not exceed 30. The translucent body with bright orange or red intestinal diverticula would make it a conspicuous object among the contents of the trawl.

Provided that the slowly moving currents presumably inhabited by many of the nemerteans are continuous throughout all the oceans, as oceanographers have concluded, and that they are continually transporting the populations of these worms not only throughout each ocean but also from one ocean to another, then it is conceivable that any of the species may eventually drift through the Monterey Bay area. A net lowered at the appropriate time might be expected to have a chance of catching an individual whose ancestors had lived or whose relatives are presently living in some far away part of the oceanic system.

The current systems presumably produce localized eddies where a population could remain and reproduce for a considerable time as is more fully discussed by Coe (1945, 1946). Eventually the members or their offspring may be swept again into the current system. It seems quite possible that the Monterey canyon contains, or did contain at the time that the collections were made, an eddy of this nature. But even there the nemertean population was far from dense considering the vast volume of water which passed through so many nets.

A similar intensive search has been made by Dr. William Beebe in the Atlantic near Bermuda, where nets 1 meter in diameter were drawn several hundred times at the appropriate depths through a circular area eight miles in diameter. There likewise, as reported by Coe (1945), a total of 14 species of bathypelagic nemerteans was found during the summers of 1929, 1930, and 1931, but it is uncertain whether these two examples with similar results indicate more or less permanent local populations or whether the captured individuals were drifting past those localities at the precise times when the nets were lowered to catch them. The hydrographic data indicate water movements of considerable magnitude at the depths at which the nemerteans were obtained.

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ZOOLOGY.—*A new species of the genus* Diarthrodes (*Crustacea, Copepoda*) *parasitic in a red alga.*[1] Wolf-Henrich Fahrenbach, University of California. (Communicated by Fenner A. Chace, Jr.).

In 1891 E. S. Barton described a curious phenomenon in which the copepod *Harpacticus chelifer* developed in the thallus of a red alga, *Rhodymenia palmata*, forming galls up to 1 mm in diameter. A similar relationship has been observed between a new species of the genus *Diarthrodes* and the red alga *Halosaccion glandiforme*. This species also represents the first reported occurrence of the genus on the west coast of North America.

In the systematic outline below the work of Lang (1948) has been followed throughout.

Order Copepoda
Tribe Harpacticoida
Family Thalestridae
Subfamily Dactylopodiinae
Genus **Diarthrodes** Thomson, 1882

Diagnosis.—Body pyriform. Epimeral plates of at least thoracic segments well developed. Rostrum not set off, directed downward. Antennule in ♀ 5–8 jointed. Exopodite of antenna 1–3 jointed. Base of mandible with 1–2 bristles (?). Exopodite of maxilla represented by 1 bristle. Exopodite of first leg not clasping, 1–2 jointed, much shorter than 3-jointed clasping endopodite. Armature of swimming legs differing somewhat from species to species. Exopodite of fifth leg in ♀ with 4–6 bristles; same for baso-endopodite.

[1] I am indebted to Dr. Cadet Hand for suggesting the problem as well as helpful advice and constructive criticism.

Diarthrodes cystoecus, n. sp. (Fig. 1)

Description.—The rostrum (Fig. 9) is pointed, its anterior edges being slightly concave. It is not longer than the width of the antennule and, therefore, usually hidden in side view.

The antennule (Fig. 2) is 8-jointed, the eighth, most distal, joint possibly being the expanded terminal bristle bases. All joints with exception of the first have at least 1 bristle at their distal borders. The third joint has three dorsal bristles, the fourth two long bristles at its distal edge, extending almost as far as the tip of the four terminal bristles.

The antenna (Fig. 3) is 3-jointed, with six terminal dorsally-bent bristles. Its exopodite is 3-jointed, each joint having a stiff lateral spine and the third joint an additional terminal spine.

The tapering subchela of the maxilliped (Fig. 4) has a long, slender dactylopodite and a thin bristle of at least the length of the dactylopodite emerging from the proximal portion of the hand.